

App1. No. 09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

IN THE CLAIMS

Please amend claims 89, 91, 93, and 96 as follows below.

This listing of claims will replace all prior versions, and listings, of claims in the application:

MARKED UP VERSION OF CLAIMS

A2

1 1. (Original) A fiber optic module for coupling
2 photons between optoelectronic devices and optical fibers, the
3 fiber optic module comprising:
4 a base;
5 a first horizontal printed circuit board (PCB) arranged
6 horizontally with the base and parallel to a first optical
7 axis of a first optoelectronic device, the first
8 optoelectronic device having terminals coupled to the first
9 horizontal printed circuit board; and
10 a second vertical printed circuit board (PCB) arranged at
11 a perpendicular angle with the base and parallel to a second
12 optical axis of a second optoelectronic device, the second
13 optoelectronic device having terminals coupled to the second
14 vertical printed circuit board.

1 2. (Original) The fiber optic module of claim 1
2 further comprising:
3 a housing coupled to the base.

1 3. (Original) The fiber optic module of claim 2
2 wherein,

3918P002XX3
Serial No. 09/833,107

3

WEA/sm

App1. No. 09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

3 the housing is a shielded housing to encase the first and
4 second printed circuit boards to reduce electromagnetic
5 interference (EMI).

1 4. (Original) The fiber optic module of claim 3
2 wherein,
3 the housing has an inner septum to separate the fiber
4 optic module into a first side and a second side and the inner
5 septum is a conductive shield to reduce crosstalk
6 electromagnetic radiation.

1 5. (Original) The fiber optic module of claim 1
2 wherein,
3 the base has a first and second opening;
4 the first horizontal printed circuit board has a
5 plurality of pins extending through the first opening in the
6 base to couple to a host printed circuit board; and
7 the second vertical printed circuit board has a plurality
8 of pins extending through the second opening in the base to
9 couple to the host printed circuit board.

1 6. (Original) The fiber optic module of claim 5
2 wherein,
3 the first and second opening in the base are a plurality
4 of pin holes in the base.

1 7. (Original) The fiber optic module of claim 5
2 wherein,
3 the first and second opening in the base are a first and

3918P002XX3

Serial No. 09/833,107

4

WEA/sm

App1. No. 09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

4 second cutout in the base.

1 8. (Original) The fiber optic module of claim 1
2 wherein, the first horizontal and second vertical printed
3 circuit boards further comprises:
4 electrical components coupled between the first
5 optoelectronic device and the plurality of pins of the first
6 printed circuit board and between the second optoelectronic
7 device and the plurality of pins of the second printed circuit
8 board, the electrical components for controlling the first and
9 second optoelectronic devices.

Q2
Cont

1 9. (Original) The fiber optic module of claim 1
2 wherein, the first horizontal printed circuit board further
3 comprises:
4 a ground plane to reduce electro-magnetic fields
5 generated by the electrical components.

1 10. (Original) The fiber optic module of claim 1
2 wherein, the second vertical printed circuit board further
3 comprises:
4 a ground plane to reduce electro-magnetic fields
5 generated by the electrical components.

1 11. (Original) The fiber optic module of claim 1

3918P002XX3

5

WEA/sm

Serial No. 09/833,107

Appl. No. '09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

2 further comprising:

3 a first optical block coupled to the first optoelectronic
4 device, the first optical block having a first opening to
5 receive the first optoelectronic device, and
6 a first lens to couple photons between the first
7 optoelectronic device and an optical fiber.

1 12. (Original) The fiber optic module of claim 11

2 further comprising:

3 a nose coupled to the base, the nose to receive an
4 optical fiber connector and to hold an optical fiber
5 substantially fixed and aligned with an optical opening of the
6 optical block.

1 13. (Original) The fiber optic module of claim 12

2 further comprising:

3 a nose shield surrounding the nose to reduce
4 electromagnetic interference.

1 14. (Original) The fiber optic module of claim 1

2 further comprising:

3 a second optical block coupled to the second
4 optoelectronic device, the second optical block having
5 a second opening to receive the second optoelectronic
6 device, and
7 a second lens to couple photons between the second
8 optoelectronic device and an optical fiber.

3918P002XX3

Serial No. 09/833,107

6

WEA/sm

Appl. No. 09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

1 15. (Original) The fiber optic module of claim 11

2 further comprising:

3 a second optical block coupled to the second

4 optoelectronic device, the second optical block having

5 a second opening to receive the second optoelectronic
6 device, and

7 a second lens to couple photons between the second
8 optoelectronic device and an optical fiber.

1 16. (Original) The fiber optic module of claim 1

2 further comprising:

3 an optical block coupled to the first and second

4 optoelectronic devices, the optical block having

5 first and second openings to receive the first and second
6 optoelectronic devices,

7 a first lens to couple photons between the first
8 optoelectronic device and a first optical fiber, and

9 a second lens to couple photons between the second
10 optoelectronic device and a second optical fiber.

1 17. (Original) The fiber optic module of claim 16,

2 wherein,

3 the first lens of the optical block to launch photons
4 into the first optical fiber from the first optoelectronic
5 device.

3918P002XX3

Serial No. 09/833,107

7

WEA/sm

Appl. No. '09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

1 18. (Original) The fiber optic module of claim 16,
2 wherein,
3 the second lens of the optical block is a focusing lens
4 to receive photons from the second optical fiber and to couple
5 them to the second optoelectronic device.

1 19. (Original) The fiber optic module of claim 16
2 further comprising:
3 a nose coupled to the base, the nose to receive an
4 optical fiber connector and to hold an optical fiber
5 substantially fixed and aligned with an optical opening of the
6 optical block.

1 20. (Original) The fiber optic module of claim 19
2 further comprising:
3 a nose shield surrounding the nose to reduce
4 electromagnetic interference.

1 21. (Original) The fiber optic module of claim 13,
2 wherein,
3 the first optoelectronic device is a photodetector.

1 22. (Original) The fiber optic module of claim 13,
2 wherein,
3 the second optoelectronic device is an emitter.

3918P002XX3
Serial No. 09/833,107

8

WEA/sm

Appl. No. '09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

1 23. (Original) The fiber optic module of claim 22,
2 wherein,
3 the emitter is a vertical cavity surface emitting laser
4 (VCSEL).

1 24. (Original) A fiber optic transceiver for coupling
2 photons between optoelectronic devices and optical fibers, the
3 fiber optic transceiver comprising:
4 a base;
5 a first vertical printed circuit board (PCB) arranged at
6 a perpendicular angle with the base and parallel to a first
7 optical axis of a first optoelectronic device, the first
8 vertical printed circuit board having a first connecting means
9 to couple to an external printed circuit board, the first
10 optoelectronic device having terminals coupled to the first
11 vertical printed circuit board;
12 a second slanted printed circuit board (PCB) arranged at
13 an angle with the base and parallel to a second optical axis
14 of a second optoelectronic device, the second slanted printed
15 circuit board having a second connecting means to couple to an
16 external printed circuit board, the second optoelectronic
17 device having terminals coupled to the second slanted printed
18 circuit board;
19 a housing coupled to the base, the housing to cover the
20 first vertical printed circuit board and the second slanted
21 printed circuit board.

1 25. (Original) The fiber optic transceiver of claim 24

3918P002XX3

9

WEA/sm

Serial No. 09/833,107

Appl. No. '09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

2 wherein,

3 the first vertical printed circuit board further
4 comprises:

5 first electrical components coupled between the
6 first optoelectronic device and the first connecting
7 means on a first side of the first internal printed
8 circuit board, the first electrical components for
9 controlling the first optoelectronic device, and
10 a first ground plane coupled to a second side of the
11 first internal printed circuit board to reduce electro-
12 magnetic fields;

13 and,

14 the second slanted printed circuit board further
15 comprises:

16 second electrical components coupled between the second
17 optoelectronic device and the second connecting means on a
18 first side of the second slanted printed circuit board, the
19 second electrical components for controlling the second
20 optoelectronic device.

1 26. (Original) The fiber optic transceiver of claim 25

2 wherein,

3 the second slanted printed circuit board further
4 comprises:

5 a second ground plane coupled to a second side of
6 the second slanted printed circuit board to reduce
7 electro-magnetic fields.

1 27. (Original) The fiber optic transceiver of claim 24,

3918P002XX3

10

WEA/sm

Serial No. 09/833,107

Appl. No. 09/833,107
Amdt. Dated 05/13/2004
Reply to Office Action of 04/13/2004

2 wherein,

3 the first connecting means and the second connecting
4 means are pins to couple to pin receptacles of the external
5 printed circuit board.

1 28. (Original) The fiber optic transceiver of claim 24,

2 wherein,

3 the first connecting means and the second connecting
4 means are connectors to couple into connectors of the external
5 printed circuit board.

1 29. (Original) The fiber optic transceiver of claim 24

2 further comprising:

3 an optical block coupled to the first optoelectronic
4 device and the second optoelectronic device, the optical block
5 having a first lens to couple photons between the first
6 optoelectronic device and a first optical fiber and a second
7 lens to couple photons between the second optoelectronic
8 device and a second optical fiber.

1 30. (Original) The fiber optic transceiver of claim 24

2 further comprising:

3 a first optical block coupled to the first optoelectronic
4 device, the first optical block having a first lens to couple
5 photons between the first optoelectronic device and a first
6 optical fiber, and

7 a second optical block coupled to the second

3918P002XX3
Serial No. 09/833,107

11

WEA/sm

Appl. No. 09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

8 optoelectronic device, the second optical block having a
9 second lens to couple photons between the second
10 optoelectronic device and a second optical fiber.

1 31. (Original) The fiber optic transceiver of claim 24
2 further comprising:

3 a nose coupled to the base, the nose for receiving an
4 optical fiber connector and holding a pair of optical fibers
5 substantially fixed and aligned with the first optoelectronic
6 device and the second optoelectronic device.

1 32. (Original) The fiber optic transceiver of claim 31
2 further comprising:

3 a nose shield surrounding the nose to reduce
4 electromagnetic interference.

1 33. (Original) The fiber optic transceiver of claim 24
2 further comprising:

3 an internal shield inserted between the first vertical
4 printed circuit board and the second slanted printed circuit
5 board, the internal shield to reduce electrical crosstalk.

1 34. (Original) A fiber optic module for coupling
2 photons between optoelectronic devices and optical fibers, the
3 fiber optic module comprising:

4 a base;

5 a first slanted printed circuit board (PCB) arranged on a
6 slanted angle with the base and parallel to a first optical

3918P002XX3

Serial No. 09/833,107

12

WEA/sm

Appl. No. 09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

7 axis of a first optoelectronic device, the first slanted
8 printed circuit board having a ground plane on one side, the
9 first optoelectronic device having terminals coupled to the
10 first slanted printed circuit board;

11 a second vertical printed circuit board (PCB) arranged at
12 a perpendicular angle with the base and parallel to a second
13 optical axis of a second optoelectronic device, the second
14 optoelectronic device having terminals coupled to the second
15 vertical printed circuit board; and

16 a housing coupled to the base.

1 35. (Original) The fiber optic module of claim 34
2 wherein,

3 the housing is a shielded housing to encase the first
4 slanted and second vertical printed circuit boards to reduce
5 electromagnetic interference (EMI).

1 36. (Original) The fiber optic module of claim 34
2 wherein,

3 the second vertical printed circuit board has a ground
4 plane on one side.

1 37. (Original) A fiber optic module for coupling
2 photons between optoelectronic devices and optical fibers, the
3 fiber optic module comprising:

4 a base;

5 a first slanted printed circuit board (PCB) arranged on a
6 slanted angle with the base and parallel to a first optical
7 axis of a first optoelectronic device, the first

Appl. No. 09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

8 optoelectronic device having terminals coupled to the first
9 slanted printed circuit board; and
10 a second slanted printed circuit board (PCB) arranged on
11 a slanted angle with the base and parallel to a second optical
12 axis of a second optoelectronic device, the second slanted
13 printed circuit board having a ground plane on one side, the
14 second optoelectronic device having terminals coupled to the
15 second vertical printed circuit board; and
16 a housing coupled to the base.

Al2
Cont 1 38. (Original) The fiber optic module of claim 37
2 wherein,
3 the housing is a shielded housing to encase the first and
4 second printed circuit boards to reduce electromagnetic
5 interference (EMI).

1 39. (Original) The fiber optic module of claim 37
2 wherein,
3 the first slanted printed circuit board has a ground
4 plane on one side.

1 40. (Original) A fiber optic module comprising:
2 a first optical block having a first opening to receive a
3 first optoelectronic device;
4 the first optoelectronic device coupled into the first
5 opening;
6 a second optical block having a second opening to receive
7 a second optoelectronic device;
8 the second optoelectronic device coupled into the second

3918P002XX3
Serial No. 09/833,107

14

WEA/sm

Appl. No. 09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

9 opening;

10 a first printed circuit board coupled to terminals of the
11 first optoelectronic device in parallel with a plane of the
12 first optical block, the first printed circuit board parallel
13 to a first optical axis of the first optoelectronic device;
14 and

15 a second printed circuit board coupled to terminals of
16 the second optoelectronic device perpendicular with a plane of
17 the second optical block, the second printed circuit board
18 parallel to a second optical axis of the second optoelectronic
19 device.

A2
cont

1 41. (Original) The fiber optic module of claim 40,
2 wherein the fiber optic module is a fiber optic transceiver
3 and
4 the first optoelectronic device is a transmitter to
5 couple photons into a first optical fiber, and
6 the second optoelectronic device is a receiver to receive
7 photons from a second optical fiber.

1 42. (Original) The fiber optic module of claim 40,
2 wherein the fiber optic module is a fiber optic transceiver
3 and
4 the first optoelectronic device is a receiver to receive
5 photons from a first optical fiber, and
6 the second optoelectronic device is a transmitter to
7 couple photons into a second optical fiber.

1 43. (Original) A fiber optic module comprising:

3918P002XX3
Serial No. 09/833,107

15

WEA/sm

Appl. No. '09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

2 an optical block having a first opening to receive a
3 first optoelectronic device and a second opening to receive a
4 second optoelectronic device;
5 the first optoelectronic device coupled into the first
6 opening;
7 the second optoelectronic device coupled into the second
8 opening;
9 a base having a first guide rail;
10 a first vertical printed circuit board coupled to
11 terminals of the first optoelectronic device in parallel to a
12 first optical axis of the first optoelectronic device, the
13 first vertical printed circuit board coupled to the first
14 guide rail of the base perpendicular with the base; and
15 a second horizontal printed circuit board coupled to
16 terminals of the second optoelectronic device in parallel to a
17 second optical axis of the second optoelectronic device, the
18 second horizontal printed circuit board parallel to the base.

1 44. (Original) The fiber optic module of claim 43
2 further comprising:
3 a housing coupled to the base.

1 45. (Original) The fiber optic module of claim 44
2 wherein,
3 the housing is a shielded housing to encase the first
4 vertical and second horizontal printed circuit boards to
5 reduce electromagnetic interference (EMI).

1 46. (Original) The fiber optic module of claim 43

3918P002XX3
Serial No. 09/833,107

16

WEA/sm

Appl. No. 09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

2 wherein,

3 the base has a pair of cutouts to allow pins of the first
4 vertical printed circuit board and pins of the second
5 horizontal printed circuit board to extend through.

1 47. (Original) The fiber optic module of claim 43

2 wherein,

3 the base has a pair of openings to allow pins of the
4 first vertical printed circuit board and pins of the second
5 horizontal printed circuit board to extend through.

1 48. (Original) The fiber optic module of claim 43,

2 wherein the fiber optic module is a fiber optic transceiver
3 and

4 the first optoelectronic device is a transmitter to
5 couple photons into a first optical fiber, and

6 the second optoelectronic device is a receiver to receive
7 photons from a second optical fiber.

1 49. (Original) The fiber optic module of claim 43,

2 wherein the fiber optic module is a fiber optic transceiver
3 and

4 the first optoelectronic device is a receiver to receive
5 photons from a first optical fiber, and

6 the second optoelectronic device is a transmitter to
7 couple photons into a second optical fiber.

1 50. (Original) A fiber optic module comprising:

2 an optical block having a first opening to receive a

3918P002XX3

17

WEA/sm

Serial No. 09/833,107

Appl. No. '09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

3 first optoelectronic device and a second opening to receive a
4 second optoelectronic device;

5 the first optoelectronic device coupled into the first
6 opening;

7 the second optoelectronic device coupled into the second
8 opening;

9 a base having a pair of brackets on one side;

10 a first vertical printed circuit board coupled to
11 terminals of the first optoelectronic device in parallel to a
12 first optical axis of the first optoelectronic device, the
13 first vertical printed circuit board coupled to the pair of
14 brackets of the base; and

15 a second horizontal printed circuit board coupled to
16 terminals of the second optoelectronic device in parallel to a
17 second optical axis of the second optoelectronic device, the
18 second horizontal printed circuit board parallel to the base.

1 51. (Original) The fiber optic module of claim 50
2 further comprising:

3 a housing coupled to the base.

1 52. (Original) The fiber optic module of claim 50
2 wherein,

3 the housing is a shielded housing to encase the first
4 vertical and second horizontal printed circuit boards to
5 reduce electromagnetic interference (EMI).

1 53. (Original) The fiber optic module of claim 50
2 wherein,

3918P002XX3
Serial No. 09/833,107

18

WEA/sm

Appl. No. 09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

3 the base has a pair of cutouts to allow pins of the first
4 vertical printed circuit board and pins of the second
5 horizontal printed circuit board to extend through.

1 54. (Original) The fiber optic module of claim 50
2 wherein,

3 the base has a pair of openings to allow pins of the
4 first vertical printed circuit board and pins of the second
5 horizontal printed circuit board to extend through.

1 55. (Original) The fiber optic module of claim 50,
2 wherein the fiber optic module is a fiber optic transceiver
3 and

4 the first optoelectronic device is a transmitter to
5 couple photons into a first optical fiber, and

6 the second optoelectronic device is a receiver to receive
7 photons from a second optical fiber.

1 56. (Original) The fiber optic module of claim 50,
2 wherein the fiber optic module is a fiber optic transceiver
3 and

4 the first optoelectronic device is a receiver to receive
5 photons from a first optical fiber, and

6 the second optoelectronic device is a transmitter to
7 couple photons into a second optical fiber.

1 57. (Original) A fiber optic module comprising:
2 an optical block having a first opening to receive a
3 first optoelectronic device and a second opening to receive a

3918P002XX3

19

WEA/sm

Serial No. 09/833,107

Appl. No. 09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

4 second optoelectronic device, the optical block further having
5 a first slot to receive an end of a first vertical printed
6 circuit board and a second slot to receive an end of a second
7 horizontal printed circuit board;

8 the first optoelectronic device coupled into the first
9 opening;

10 the second optoelectronic device coupled into the second
11 opening;

12 a base;

13 the first vertical printed circuit board coupled to
14 terminals of the first optoelectronic device in parallel to a
15 first optical axis of the first optoelectronic device, the
16 first vertical printed circuit board coupled to the first slot
17 of the optical block perpendicular with the base; and

18 the second horizontal printed circuit board coupled to
19 terminals of the second optoelectronic device in parallel to a
20 second optical axis of the second optoelectronic device, the
21 second horizontal printed circuit board coupled to the second
22 slot of the optical block in parallel with the base.

1 58. (Original) The fiber optic module of claim 57
2 further comprising:

3 a housing coupled to the base.

1 59. (Original) The fiber optic module of claim 58
2 wherein,

3 the housing is a shielded housing to encase the first
4 vertical and second horizontal printed circuit boards to
5 reduce electromagnetic interference (EMI).

3918P002XX3

20

WEA/sm

Serial No. 09/833,107

Appl. No. 09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

1 60. (Original) The fiber optic module of claim 57
2 wherein,
3 the base has a pair of cutouts to allow pins of the first
4 vertical printed circuit board and pins of the second
5 horizontal printed circuit board to extend through.

1 61. (Original) The fiber optic module of claim 57
2 wherein,
3 the base has a pair of openings to allow pins of the
4 first vertical printed circuit board and pins of the second
5 horizontal printed circuit board to extend through.

Q2
con'x
1 62. (Original) The fiber optic module of claim 57,
2 wherein the fiber optic module is a fiber optic transceiver
3 and
4 the first optoelectronic device is a transmitter to
5 couple photons into a first optical fiber, and
6 the second optoelectronic device is a receiver to receive
7 photons from a second optical fiber.

1 63. (Original) The fiber optic module of claim 57,
2 wherein the fiber optic module is a fiber optic transceiver
3 and
4 the first optoelectronic device is a receiver to receive
5 photons from a first optical fiber, and
6 the second optoelectronic device is a transmitter to
7 couple photons into a second optical fiber.

3918P002XX3
Serial No. 09/833,107

21

WEA/sm

Appl. No. 09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

1 64. (Original) A fiber optic module comprising:
2 an optical block having a first opening to receive a
3 first optoelectronic device and a second opening to receive a
4 second optoelectronic device;
5 the first optoelectronic device coupled into the first
6 opening;
7 the second optoelectronic device coupled into the second
8 opening;
9 a base;
10 a slanted printed circuit board (PCB) coupled to
11 terminals of the first optoelectronic device in parallel to a
12 first optical axis of the first optoelectronic device, the
13 slanted printed circuit board arranged at an angle to slant
14 inward from the base; and
15 a vertical printed circuit board (PCB) coupled to
16 terminals of the second optoelectronic device in parallel to a
17 second optical axis of the second optoelectronic device, the
18 vertical printed circuit board arranged at a perpendicular
19 angle with the base.

1 65. (Original) The fiber optic module of claim 64
2 further comprising:
3 a housing coupled to the base.

1 66. (Original) The fiber optic module of claim 65
2 wherein,
3 the housing is a shielded housing to encase the first
4 slanted and second vertical printed circuit boards to reduce

3918P002XX3
Serial No. 09/833,107

22

WEA/sm

Appl. No. 09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

5 electromagnetic interference (EMI).

1 67. (Original) The fiber optic module of claim 65
2 wherein,
3 the slanted printed circuit board and the vertical
4 printed circuit board each have a plurality of pins to couple
5 to a host system printed circuit board.

1 68. (Original) The fiber optic module of claim 67
2 wherein,
3 the base has a pair of cutouts to allow the pins of the
4 slanted printed circuit board and the pins of the vertical
5 printed circuit board to extend through.

A2
Cont
1 69. (Original) The fiber optic module of claim 67
2 wherein,
3 the base has a pair of openings to allow the pins of the
4 slanted printed circuit board and the pins of the vertical
5 printed circuit board to extend through.

1 70. (Original) The fiber optic module of claim 64,
2 wherein the fiber optic module is a fiber optic transceiver
3 and
4 the first optoelectronic device is a transmitter to
5 couple photons into a first optical fiber, and
6 the second optoelectronic device is a receiver to receive
7 photons from a second optical fiber.

1 71. (Original) The fiber optic module of claim 64

3918P002XX3

23

WEA/sm

Serial No. 09/833,107

Appl. No. 09/833,107
Amdt. Dated 05/13/2004
Reply to Office Action of 04/13/2004

2 wherein,
3 the slanted printed circuit board and the vertical
4 printed circuit board each have a connector to couple to a
5 connector of a host system printed circuit board.

1 72. (Original) The fiber optic module of claim 64
2 further comprising:
3 a housing having an opening at an end coupled to the
4 base.

1 73. (Original) The fiber optic module of claim 72,
2 wherein,
3 the slanted printed circuit board and the vertical
4 printed circuit board each have a connector to couple to a
5 connector of a host system printed circuit board through the
6 opening at the end of the housing.

1 74. (Original) The fiber optic module of claim 64
2 wherein,
3 the base includes an inner septum to separate the fiber
4 optic module into a first side and a second side.

1 75. (Original) A fiber optic module comprising:
2 an optical block having a first opening to receive a
3 first optoelectronic device and a second opening to receive a
4 second optoelectronic device;
5 the first optoelectronic device coupled into the first
6 opening;
7 the second optoelectronic device coupled into the second

3918P002XX3
Serial No. 09/833,107

24

WEA/sm

Appl. No. 09/833,107
Amdt. Dated 05/13/2004
Reply to Office Action of 04/13/2004

8 opening;
9 a base;
10 a slanted printed circuit board (PCB) coupled to
11 terminals of the first optoelectronic device in parallel to a
12 first optical axis of the first optoelectronic device, the
13 slanted printed circuit board arranged at an angle to slant
14 outward from the base; and
15 a vertical printed circuit board (PCB) coupled to
16 terminals of the second optoelectronic device in parallel to a
17 second optical axis of the second optoelectronic device, the
18 vertical printed circuit board arranged perpendicular to the
19 base.

Q2
cont
1 76. (Original) The fiber optic module of claim 75
2 further comprising:
3 a housing coupled to the base.

1 77. (Original) The fiber optic module of claim 76
2 wherein,
3 the housing is a shielded housing to encase the slanted
4 and vertical printed circuit boards to reduce electromagnetic
5 interference (EMI).

1 78. (Original) The fiber optic module of claim 75
2 wherein,
3 the slanted printed circuit board and the vertical
4 printed circuit board each have a pin header with a plurality
5 of pins to couple to a host system printed circuit board.

Appl. No. 09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

1 79. (Original) The fiber optic module of claim 75
2 wherein,
3 the slanted printed circuit board and the vertical
4 printed circuit board each have a plurality of pins to couple
5 to a host system printed circuit board.

1 80. (Original) The fiber optic module of claim 79
2 wherein,
3 the base has a pair of cutouts to allow the pins of the
4 slanted printed circuit board and the pins of the vertical
5 printed circuit board to extend through.

*Ad
con't*

1 81. (Original) The fiber optic module of claim 79
2 wherein,
3 the base has a pair of openings to allow the pins of the
4 slanted printed circuit board and the pins of the vertical
5 printed circuit board to extend through.

1 82. (Original) The fiber optic module of claim 75,
2 wherein the fiber optic module is a fiber optic transceiver
3 and
4 the first optoelectronic device is a transmitter to
5 couple photons into a first optical fiber, and
6 the second optoelectronic device is a receiver to receive
7 photons from a second optical fiber.

1 83. (Original) The fiber optic module of claim 75
2 wherein,

3918P002XX3
Serial No. 09/833,107

26

WEA/sm

Appl. No. 09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

3 the slanted printed circuit board and the vertical
4 printed circuit board each have a connector to couple to a
5 connector of a host system printed circuit board.

1 84. (Original) The fiber optic module of claim 75
2 further comprising:
3 a housing having an opening at an end coupled to the
4 base.

1 85. (Original) The fiber optic module of claim 84,
2 wherein,
3 the slanted printed circuit board and the vertical
4 printed circuit board each have a connector to couple to a
5 connector of a host system printed circuit board through the
6 opening at the end of the housing.

1 86. (Original) The fiber optic module of claim 75
2 wherein,
3 the base includes an inner septum to separate the fiber
4 optic module into a first side and a second side.

1 87. (Original) The fiber optic module of claim 75
2 further comprising:
3 a housing having an inner septum to separate the fiber
4 optic module into a first side and a second side, the housing
5 coupled to the base.

1 88. (Original) The fiber optic module of claim 87

3918P002XX3
Serial No. 09/833,107

27

WEA/sm

Appl. No. 09/833,107
Amdt. Dated 05/13/2004
Reply to Office Action of 04/13/2004

2 wherein,
3 the housing is a conductive shielded housing to encase
4 the slanted and vertical printed circuit boards to reduce
5 electromagnetic interference (EMI) and the septum is a
6 conductive shield to reduce crosstalk electromagnetic
7 radiation.

1 89. (Currently Amended) A fiber optic module for
2 coupling photons between optoelectronic devices and optical
3 fibers, the fiber optic module comprising:
4 a horizontal printed circuit board (PCB) arranged
5 horizontally having a first plurality of pins and a second
6 plurality of pins to couple to a host printed circuit board;
7 a first vertical printed circuit board (PCB) coupled to
8 the horizontal printed circuit board arranged at a
9 perpendicular angle and parallel to a first optical axis of a
10 first optoelectronic device, the first optoelectronic device
11 having terminals coupled to the first vertical printed circuit
12 board; [.]
13 a second vertical printed circuit board (PCB) coupled to
14 the horizontal printed circuit board arranged at a
15 perpendicular angle and parallel to a second optical axis of a
16 second optoelectronic device, the second optoelectronic device
17 having terminals coupled to the second vertical printed
18 circuit board; and
19 a housing coupled to the horizontal printed circuit
20 board.

1 90. (Original) The fiber optic module of claim 89
2 wherein,

3918P002XX3
Serial No. 09/833,107

28

WEA/sm

Appl. No. 09/833,107
Amdt. Dated 05/13/2004
Reply to Office Action of 04/13/2004

3 the housing is a shielded housing to encase the
4 horizontal and the first and the second vertical printed
5 circuit boards to reduce electromagnetic interference (EMI).

Q2
cont

1 91. (Currently Amended) A fiber optic module for
2 coupling photons between optoelectronic devices and optical
3 fibers, the fiber optic module comprising:
4 a base having a first opening and a second opening;
5 a horizontal printed circuit board (PCB) arranged
6 horizontally having a first plurality of pins protruding
7 through the first opening and a second plurality of pins
8 protruding through the second opening to couple to a host
9 printed circuit board;
10 a first vertical printed circuit board (PCB) coupled to
11 the horizontal printed circuit board arranged at a
12 perpendicular angle and parallel to a first optical axis of a
13 first optoelectronic device, the first optoelectronic device
14 having terminals coupled to the first vertical printed circuit
15 board; [[.]]
16 a second vertical printed circuit board (PCB) coupled to
17 the horizontal printed circuit board arranged at a
18 perpendicular angle and parallel to a second optical axis of a
19 second optoelectronic device, the second optoelectronic device
20 having terminals coupled to the second vertical printed
21 circuit board; and
22 a housing coupled to the horizontal printed circuit
23 board.

1 92. (Original) The fiber optic module of claim 91
2 wherein,

3918P002XX3
Serial No. 09/833,107

29

WEA/sm

Appl. No. 09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

3 the housing is a shielded housing to encase the
4 horizontal and the first and the second vertical printed
5 circuit boards to reduce electromagnetic interference (EMI).

1 93. (Currently Amended) A fiber optic module for
2 coupling photons between optoelectronic devices and optical
3 fibers, the fiber optic module comprising:
4 a horizontal printed circuit board (PCB) arranged
5 horizontally having a first plurality of pins and a second
6 plurality of pins to couple to a host printed circuit board
7 and a first optoelectronic device having terminals coupled to
8 the horizontal printed circuit board; [[.]]
9 a vertical printed circuit board (PCB) coupled to the
10 horizontal printed circuit board arranged at a perpendicular
11 angle and parallel to a second optical axis of a second
12 optoelectronic device, the second optoelectronic device having
13 terminals coupled to the vertical printed circuit board; and
14 a housing coupled to the horizontal printed circuit
15 board.

1 94. (Original) The fiber optic module of claim 93
2 wherein,
3 the housing is a shielded housing to encase the
4 horizontal and the vertical printed circuit boards to reduce
5 electromagnetic interference (EMI).

1 95. (Original) The fiber optic module of claim 93
2 wherein,
3 the horizontal printed circuit board is arranged parallel

3918P002XX3
Serial No. 09/833,107.

30

WEA/sm

Appl. No. 09/833,107

Amdt. Dated 05/13/2004

Reply to Office Action of 04/13/2004

4 to a first optical axis of the first optoelectronic device.

1 96. (Currently Amended) A fiber optic module for
2 coupling photons between optoelectronic devices and optical
3 fibers, the fiber optic module comprising:
4 a base having a first opening and a second opening;
5 a horizontal printed circuit board (PCB) arranged
6 horizontally having a first plurality of pins protruding
7 through the first opening and a second plurality of pins
8 protruding through the second opening to couple to a host
9 printed circuit board and a first optoelectronic device having
10 terminals coupled to the horizontal printed circuit board;
11 [[.]]

12 a vertical printed circuit board (PCB) coupled to the
13 horizontal printed circuit board arranged at a perpendicular
14 angle and parallel to a second optical axis of a second
15 optoelectronic device, the second optoelectronic device having
16 terminals coupled to the vertical printed circuit board; and
17 a housing coupled to the base.

1 97. (Original) The fiber optic module of claim 96
2 wherein,
3 the housing is a shielded housing to encase the
4 horizontal and the vertical printed circuit boards to reduce
5 electromagnetic interference (EMI).

1 98. (Original) The fiber optic module of claim 96

3918P002XX3
Serial No. 09/833,107

31

WEA/sm

Appl. No. 09/833,107
Amdt. Dated 05/13/2004
Reply to Office Action of 04/13/2004

- ad
concl.*
- 2 wherein,
 - 3 the horizontal printed circuit board is arranged parallel
 - 4 to a first optical axis of the first optoelectronic device.
-

3918P002XX3
Serial No. 09/833,107

32

WEA/sm